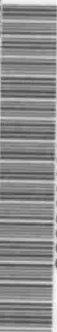


*Detroit R.*

STANDARDS DEVELOPMENT BRANCH OMIOE



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ONTARIO WATER RESOURCES COMMISSION

CITY OF WINDSOR

TREE INJURY COMPLAINT

**SD**  
**13**  
**.C56**  
**1970**  
MOE

P. F. McKenna

1970

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**SD**  
**13**  
**.C56**  
**1970**

City of Windsor : tree injury  
complaint / McKenna, P.F.

80523

ONTARIO WATER RESOURCES COMMISSION

REPORT ON FIELD INVESTIGATIONS

DATE OF EXAMINATION - Sept. 24-25, 1969. PLACE - City of Windsor

MATTER INVESTIGATED - Tree Injury Complaint

AT REQUEST OF - R. Gotts, Division of Industrial Wastes

INSPECTION MADE IN COMPANY WITH -

OTHER PARTIES SEEN -

Mr. Ron Housain, District 1, Division of Industrial Wastes  
Mr. Ed Snow, Plant Manager, East Side Plating Company  
Mrs. Moncion, Complainant

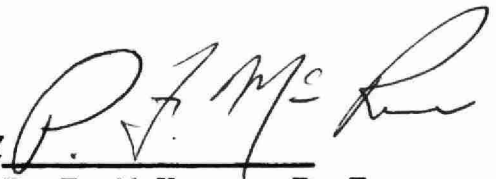
REPORTS TO BE SENT TO -

Dr. S. N. Linzon, Air Management Branch,  
Department of Energy and Resources Management.

Mr. R. Gotts  
Surveys and Projects Branch (2)  
Central Records

OTHER RECOMMENDATIONS TO THE OFFICE RE PROCEDURE TO FOLLOW -

REPORT BY

  
P. F. McKenna, P. Eng.

NOTE: This completed form to be attached to each report.

## REPORT

# Ontario Water Resources Commission

Municipality..... City of Windsor ..... Date of Inspection Sept. 24-25, 1969.  
Re:..... Tree Injury Complaint .....  
Field Inspection by P. F. McKenna ..... Report by P. F. McKenna, P. Eng. ....

### INTRODUCTION

An investigation is being conducted by the Division of Industrial Wastes into the causes of defoliation and injury of trees on the property of Mr. Moncion, which adjoins a sludge-drying pond of the East Side Plating Company. At the request of Mr. R. Gotts of the Division of Industrial Wastes, a field investigation was conducted to establish the extent of infiltration and movement of industrial wastes from the sludge-drying pond and the possible effect upon the chemical quality of ground water in the area of the Moncion property.

Two-inch diameter holes were hand-augered into the overburden near the affected trees and at varying distances from the sludge-drying pond. The locations of the auger holes are shown on Figure 1. Soil and water samples were collected from several of the auger holes for chemical analyses. The Plant Manager of the East Side Plating Company, Mr. E. Snow, and Mrs. Moncion were interviewed during the investigation.

### Background

In 1967, the East Side Plating Company built a sludge-drying pond for temporary retention of industrial waste on property adjacent to the residence of Mr. Moncion. A clay drainage tile system was subsequently laid near the fence line between the two properties to intercept seepage from the dyke of the sludge-drying pond. The tiles were laid in a bed of gravel approximately four inches below the ground surface. The tile system discharges to the Little River south of the study area. The defoliation and injury of the trees reportedly occurred in the spring of 1969. Dr. S. N. Linzon of the Air Management Branch, Department of Energy and Resources Management, discounted the effect of air pollution upon the trees and collected samples of the foliage for chemical analysis to determine the trace elements taken up by the trees.

### TOPOGRAPHY

The land surface within the study area is characterized by flat relief. The East Side Plating Company and the Moncion property are located adjacent to the Little River. The river has eroded a steep-banked channel to a depth of 15 feet below the land surface. The dyke of the sludge-drying pond is five feet high. The industrial waste

within the pond appeared to be higher in elevation than the surrounding land surface.

#### HYDROGEOLOGY

The study area is underlain by rock of the Delaware formation, of Devonian age, which consists of coarsely crystalline to dense limestone and magnesium limestone. The overburden consists essentially of till, which is locally overlain by shallow deposits of lacustrine clay. The thickness of the overburden within the study area is unknown, but from well-log data outside the area, it may exceed 100 feet.

From auger-hole data, the overburden to a depth of three feet generally consisted of a grey, gritty clay and some sand with a low moisture content. Water was encountered in test holes 1, 2 and 4. The water rose rapidly in test hole 1 to ground surface, indicating hydraulic connection with the sludge pond and good permeability. The water in test holes 2 and 4 rose more slowly, indicating poorer lateral permeability. The gradient of the water levels in the auger holes was toward the Little River. Water did not enter the other auger holes adjacent to the dyke because the overburden comprised clay entirely. The clay tile drainage system at the time of the inspection appeared to be operating satisfactorily. Surface drainage in the area was being intercepted.

### WATER AND SOIL ANALYSIS

The results of the water and soil samples taken from the auger holes are shown on tables 1 and 2. Water samples were collected from test holes 1, 2 and 4, under vacuum through a plastic tube.

The sample of the industrial waste liquor contained high concentrations of sulphate, total chromium, and total nickel, being 7,000 ppm, 61.5 ppm, and 1,180 ppm, respectively.

The nickel and sulphate concentrations in two of the water samples from the auger holes were high and decreased away from the sludge pond. A complete determination of the constituents in the water sample from the third hole could not be carried out, but from the chloride concentration present, it can be deduced that the sample is also highly polluted. High sulphate concentrations would not be expected in water in the overburden in the Windsor area.

The analyses of the soil samples indicated that nickel and chromium are present in the soil throughout the Moncion property. These analyses may not relate to the pollution study because the samples were obtained largely from the unsaturated overburden at depths less than three feet.

Soil samples from test holes 1 and 2 contained higher concentrations of nickel, and may indicate pollution of the soil.



### CONCLUSIONS

The most seriously damaged trees are located adjacent to, and down-gradient from, the sludge pond. From the apparent gradient of the water levels in the auger holes, the direction of ground-water movement is deduced to be toward the Little River from the area of the sludge pond. The affected trees are located between the river and the sludge pond. The root systems of these trees may also have extended beneath the sludge pond. Some leakage and movement of industrial waste from the sludge pond is evident from the chemical analyses of water samples from auger holes 1, 2 and 4.

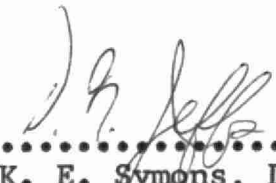
The drainage tile system installed by the East Side Plating Company along its easterly property line is only partially effective, because of its shallowness, in preventing the movement of waste to adjacent property. From the auger-hole data, it appears that some ground water moves beneath the tile system. Surface water runoff and leakage through the dyke is being intercepted by the tile system. The installation of a tile system at greater depth may result in the interception of more effluent but the discharge to the Little River would be more direct and further contaminate the river. There is no insurance that this corrective measure will prevent further injury to the trees.

All of which is respectfully submitted,

Prepared by: P. F. McKenna, Geologist,  
Surveys and Projects Branch.

Supervised by: T. J. Yakutchik, Supervisor,  
Surveys and Projects Branch.

PFM/lb  
06/02/70

  
.....  
for K. E. Symons, Director,  
Division of Water Resources.

## TABLE 1

DATE 26 NOV 69

[illegible]

ONTARIO WATER RESOURCES COMMISSION

TABLE OF SOIL ANALYSES

TABLE 2

AREA OF SURVEY WINDSOR

DATE 26 NOV 69

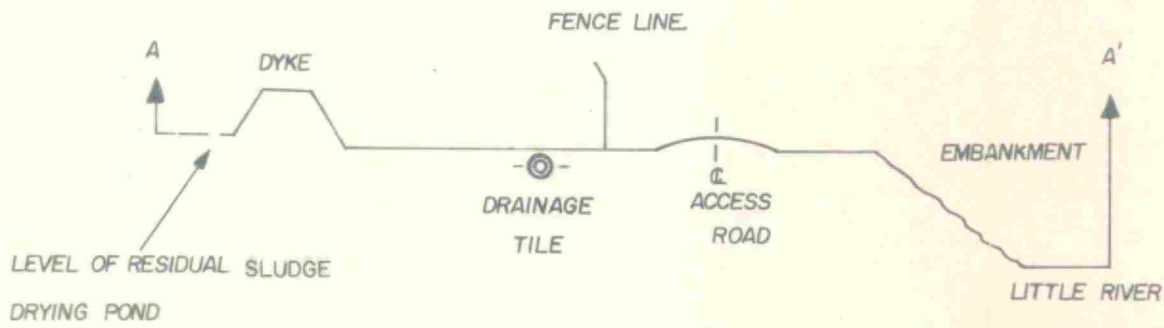
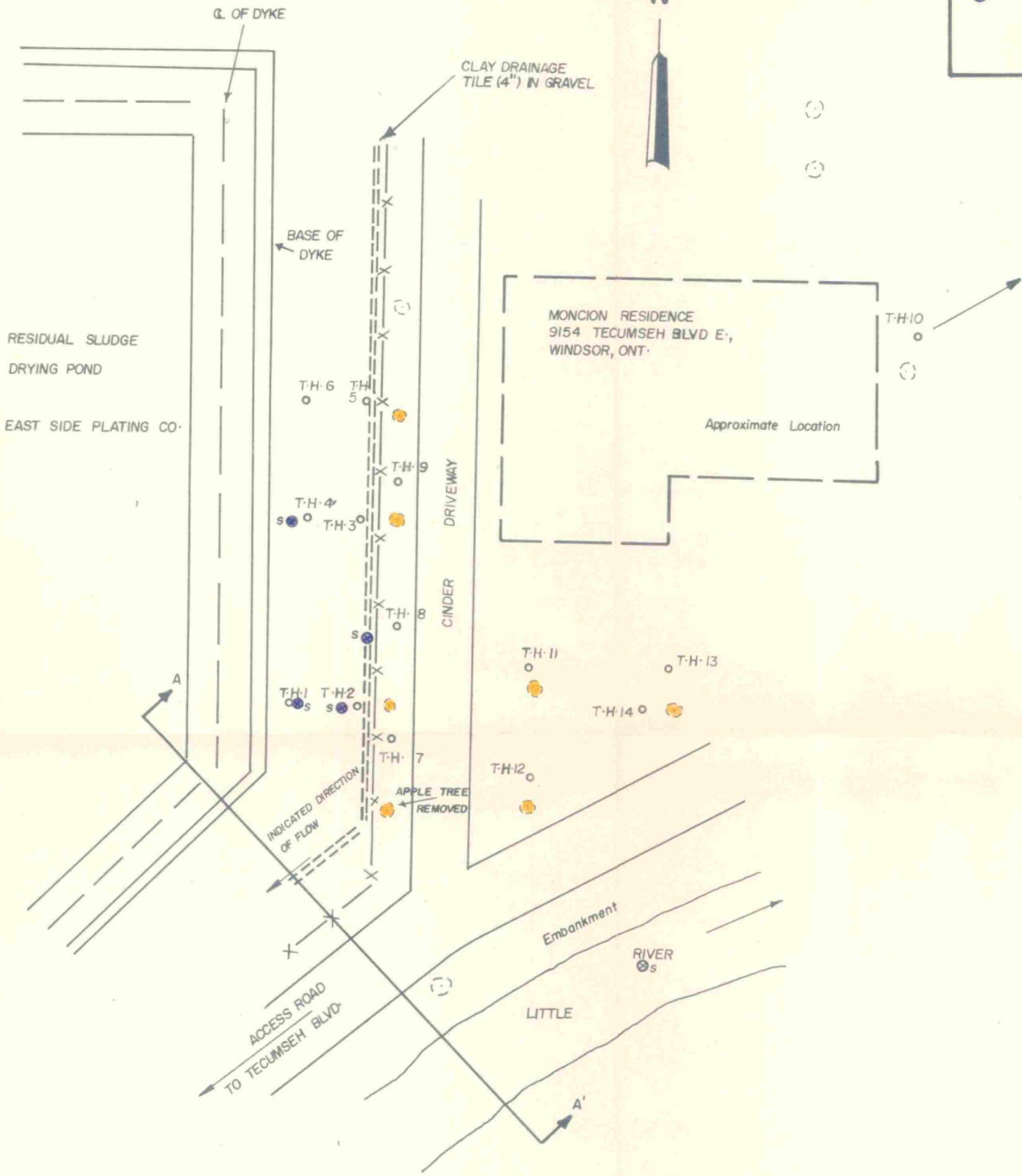
Source	Location	Date Sampled	Temperature in °F	pH OF LEACHATE	Mineral Constituents in — $\mu\text{gm/gm}$										Alkalinity as ppm $\text{CaCO}_3$	Hardness as ppm $\text{CaCO}_3$		Total Dissolved Solids in ppm	Specific Conductance (micromhos) at 25°C	Remarks
					Total Nickel	Leached Nickel	Total Chromium	Leached Chromium	Total Cadmium	Leached Cadmium	Sulphate ( $\text{SO}_4$ )	Chloride (Cl)	Total Zinc	Leached Zinc		Nitrate ( $\text{NO}_3$ )	Total			
T.H. 1	THE TEST HOLES ARE LOCATED ON FIGURE 1 TO THIS REPORT.	ALL SAMPLES TAKEN OVER 24-25 SEPT 69		7.2	50.3	1.8	32.9	.27	0.0	0.0			16.1	.93						
				7.6	252.	2.3	63.0	.00	0.0	0.0			91.5	.62						
T.H.2				7.75	77.6	1.1	53.5	.00	0.0	0.0			84.6	.62						
T.H.3				8.37	45.4	1.4	56.2	.21	0.0	0.0			89.0	.67						
T.H.4				7.35	40.8	.57	39.5	.42	0.0	0.0			56.8	.94						
T.H.5				8.07	51.2	1.5	27.1	.21	0.0	0.0			121.5	.63						
T.H.6				7.76	40.2	2.9	0.0	.26	0.0	0.0			87.8	1.0						
T.H.7				7.75	47.1	.93	27.1	.00	0.0	0.0			77.0	.62						
T.H.8				8.04	33.0	.57	17.0	.05	0.0	0.0			76.0	.42						
T.H.9				8.03	43.8	.57	79.1	.05	0.0	0.0			99.7	.42						
T.H.10				8.00	50.5	.78	59.9	<.05	0.0	0.0			84.0	.41						
T.H.11				7.80	44.1	.10	52.6	.00	0.0	0.0			80.7	.26						
T.H.12				7.70	37.3	.26	201.0	.00	0.0	0.0			79.4	.31						
T.H.13				7.6	33.3	.36	131.4	.05	0.0	0.0			68.3	.31						
T.H.14				7.55	40.0	.11	46.4	.05	0.0	0.0			84.0	.26						

LEGEND

- TEST HOLE
- X-X FENCE LINE
- ⊙ TREE
- AFFECTED TREES
- s ● WATER SAMPLE LOCATIONS

PLAN VIEW

HORIZONTAL SCALE 1" = 20'



ONTARIO WATER RESOURCES COMMISSION

TREE INJURY COMPLAINT

MONCION RESIDENCE

WINDSOR ONTARIO

DATE: NOV. 1969

SCALE:

DRAWING NO.

BY: P. McK. & LcK

1" = 20'

FIGURE 1